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CHANGES

IN

AGRICULTURE

IN

DUNDAS COUNTY

ONTARIO

- J. A. Dawson -

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CHANGES IN AGRICULTURE
IN
DUNDAS COUNTY, ONTARIO

by

J. A. Dawson

Marketing Service - Economics Division

Canada Department of Agriculture


PREFACE

The Department of Agricultural Economics of the Ontario Agricultural College, Guelph, made this study possible by supplying records taken in 1918 on dairy farms in Dundas County.

The author wishes to acknowledge the assistance of S.C. Hudson and G.P. Boucher, who acted in an advisory capacity and D.J. Packman who supervised the field work and H.D. Carr who did the major part of the office work. Also, the author wishes to thank all those farmers who provided information on various aspects of their farm businesses.

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CHANGES IN AGRICULTURE IN DUNDAS COUNTY, ONTARIO

J.A. Dawson 1/

SUMMARY

Farming in Dundas County commenced with the arrival of the first settlers in 1784. Wheat was important in the earlier years but dairying and the growing of feed grains and hay had become the basis of agriculture in the county by the turn of the century. From that time to the present the emphasis on dairying has continued to increase.

The 111 farms visited in the county in 1917 and again in 1948 did not change a great deal in the 30-year interval. The crop acreage remained about the same and the total amount of livestock did not change. Important changes, however, took place in the organization of these farms. There were fewer horses and colts and more young cattle. Hogs were subordinated to poultry as a supplementary enterprise to the dairy business. Associated with these changes in the livestock program were reduced acreages of oats and more hay and pasture; also there was a smaller total grain acreage and a great increase in purchases of feed. Heavier dairy cattle feeding and improved breeding practices resulted in higher milk production without any increase in the number of cows.

The most striking change in Canadian farming during this period was the shift to more mechanized farming. This was evidenced in Dundas County by the fact that of the 111 farms visited 65 had tractors and 67 had milking machines in 1948. The number of months of labour per farm had declined from 24 to 20 months from 1917 to 1948.

Total investment per farm was higher in 1948 than in 1917. Real estate investment was lower in spite of an increase in the value of buildings. However, investment in livestock and equipment was nearly twice as high as in 1917 and was not greatly exceeded by the amount necessary to purchase the farm itself.

Total farm receipts were 60 per cent higher in 1948 than in 1917 while expenses were 119 per cent higher, but farm incomes were at about the same level in each of the two years. The large increase in expenses was accounted for by increased feed and machinery expenses and higher prices for livestock purchased. A greater degree of commercialization was associated with the increase in mechanization. Farmers had become more vulnerable to factors outside their own control, the prices of goods and services they had to purchase taking on added significance in the conduct of their farm business.

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THE DEVELOPMENT OF AGRICULTURE IN DUNDAS COUNTY

Dundas County is located in Eastern Ontario and fronts on the St. Lawrence River between Prescott and Cornwall. This county contains some of the most productive land in Eastern Canada. About one-half of the land area is a neutral clay loam found mainly in the centre of the county; this soil is very productive when adequately drained. About one-quarter of the land is moderately shallow sandy loam located in the southern part of the county. In the western part of the county the soil is sandy and a strip along the northern edge contains areas of peat, limestone till, well drained gravelly loam and a little acid clay. Except for a strip along the St. Lawrence River, drainage is a problem throughout the county.

For many years dairying has been the most important farm enterprise in the county and the main outlets for some time have been condenseries and cheese factories located in the county. According to census data, in 1940, 50 per cent of the gross farm revenue was derived from the sale of dairy products, 10 per cent was from the sale of cattle and nine per cent from products consumed on the farm. Thus, about two-thirds of the gross farm revenue could be attributed to the dairy enterprise.

Farming in Dundas County commenced with the arrival of the first settlers in 1784. They were United Empire Loyalists and they settled first in the townships of Matilda and Williamsburg along the St. Lawrence River. Each settler was entitled to 100 acres on the river front, and 200 acres at a distance remote from the river. In addition, he was entitled to 50 acres for his wife and 50 acres for every child. Each son or daughter, on coming of age or at marriage, was entitled to a further grant of 200 acres. The greater part of the two townships which are not along the river was thus drawn by the children of United Empire Loyalists.

The land of the county was covered with forest and, although farming developed rather slowly, the trees provided an important source of income for the early settlers. Because of the work to be done on their fathers' farms few of the children who had come of age had any inducement to cultivate their own land. Their lots were sold to non-farmers and eventually resold to immigrant settlers from Britain and the United States.

The extensive timber operations were necessary but retarded the development of agriculture. In the early years

of settlement in the county many farmers were forced to sell their farms because of the time and work involved in clearing the land. With the development of the St. Lawrence canals and the increasing flow of settlers moving through to the western part of the province, employment was provided for men with teams of horses. After the completion of the Cornwall Canal in 1842 the farmers had more time to devote to farming.

By 1860 much progress had been made in the development of agriculture in the county; but even then a considerable part of the land was not yet being farmed. Of the land that was farmed, a large proportion was used to grow wheat. Dairy farming was relatively unimportant except for the production of milk for home use. Since then there has been a great decrease in the wheat acreage even though the area of occupied land in the county has increased greatly. By 1891 there was very little wheat grown in the county but the acreage in other grains (particularly oats) and hay had increased considerably.

Between 1861 and 1891 the area of occupied land increased rapidly and the increase in crops grown and land in pasture was about proportionate. Between 1891 and 1921, however, while the area of occupied land increased relatively little, the proportion in crops increased and that in pasture decreased. From 1921 to 1941 the acreage in crops increased slightly and there was some increase in pasture acreage as a result of more clearing of bush.

A large part of the increase in crop acreage between 1891 and 1941 was accounted for by an increase in the hay acreage; the total hay crop also increased as a result of increased yields. The acreage in oats dropped very sharply during these years and the acreage in mixed grains increased by the same amount as the decrease in oats. Accompanying this decrease in oats acreage was a sharp drop in the number of horses, particularly since 1911.

The number of milk cows increased rapidly up to 1901 but has not increased greatly since that time. On the other hand, the sheep population commenced to decline in 1871 and had fallen to a low level by 1911; since then sheep have not been very important in the agriculture of the county. These two opposite trends resulted in the shift from pasture to hay which occurred between 1891 and 1921.

The foregoing summary indicates the main changes which have taken place in the agriculture of Dundas County. Comparable

figures on crop acreages and yields, livestock numbers and farm prices recorded in 1917 and in 1948 - the two years for which farm business records were obtained - are presented in the remainder of this section.

The total acreage in crops was about the same in 1948 as in 1917. The acreage in hay, clover and alfalfa increased from 50,500 in 1917 to 63,200 in 1948. The acreage in wheat, barley and oats decreased but that in mixed grains increased considerably during the 30-year period.

The number of horses declined during the period from 9,600 to 6,600. The number of milk cows increased from 26,400 to 30,100 and the number of poultry increased from 227,000 to 422,000. There were 16,600 swine in 1948 as compared with 23,600 in 1917 and the number of sheep and lambs declined from 5,700 to 1,500.

Both of the years for which farm records are available were years when prices of farm products were increasing. However, in 1948 the prices of all field crops except hay were lower than in 1917. Available information does not permit a comparison of the prices of livestock and livestock products in the two years but the values of all types of livestock, except horses, were much higher in 1948 than in 1917. Even taking account of the greater technological advances in crop production, livestock farmers were probably in a better relative position in 1948 than in 1917. (These comparisons of crop prices and livestock values pertain to the Province of Ontario as a whole.)

Crop yields on the average were about the same in 1917 and 1948. Of the most important grains grown in the county, oats and mixed grain yields were higher in 1948 than in 1917 while barley yields were somewhat lower. Hay yields were slightly lower but corn silage yields were somewhat higher.

CHANGES ON DUNDAS COUNTY FARMS BETWEEN 1917 AND 1948

In 1918 the Department of Farm Management of the Ontario Agricultural College, Guelph, carried out a survey of 340 farms in the county covering the year ending April 30, 1918. This county was selected at that time as being representative of general dairy farming in Eastern Ontario, having three market outlets for milk - the cheese factory, the condensery and the city wholesale trade (Montreal). In 1949, 111 of these farms were re-visited and similar information was obtained on the farm business covering the year ending April 30, 1949.

Dundas County has had a relatively stable agricultural production pattern in the last 30 years. The 111 farms visited had about the same acreage in crops and the same amount of live-stock in each of the two years. Most of the farmers had already adopted fairly intensive dairy enterprises by 1917. However, much of the milk that formerly went into the production of cheese is now being used to produce concentrated milk products.

A comparison of the records which were obtained covering the farm business for the year 1917 and 1948 provides evidence of this stable production pattern but also provides information on the manner in which changes in technology have affected the individual farm business. The introduction of tractors as a source of farm power and the heavier feeding of dairy cattle are probably the technological changes that have had the greatest effect on farming in the county. The farm tractor has replaced horses to a large extent as a source of power and the decline in the number of horses has released more acreage for producing feed for dairy cattle. The tractor, along with the milking machine, has reduced the labour requirements on the farms. Also, farmers have increased the amount of feed fed to dairy cattle and have increased their purchases of feed. Most of the other changes that are evident in the farm business are associated with these advances.

Land Use.- The average acreage of the 111 farms was 104 in 1917 and 112 in 1948. The acreage in crops was about the same with an average of 61 in 1917 and 63 in 1948. The acreage in rotation pasture increased from 20 to 24 and that in permanent pasture increased from nine acres in 1917 to 13 acres in 1948. The acreage in woods dropped from nine to seven and there was no change in the acreage in waste land which averaged two acres in each year. The acreage taken up by yards, roads and fences, averaged about three acres in each of the two years. Thus, the increased acreage in the farms in 1948 was accounted

for mostly by a larger acreage in pasture.

Table 1.- Average Acreages of Crops on 111 Farms in Dundas County, Ontario, 1917 and 1948

	1917		1948	
	: Acreage	: Per cent of total crops	: Acreage	: Per cent of total crops
Small grains	24.1	39	22.4	36
Hay and fodder	26.7	44	32.1	51
Corn silage	7.6	12	6.2	10
Other crops	3.1	5	2.1	3
Total crops	61.5	100	62.8	100

Information on the acreage in crops is provided in Table 1. The balance between grain and roughage was about the same in the two years although there was some increase in the proportion in hay and fodder and a slight decrease in the proportion in small grains and in corn silage. Most of the increase in hay acreage was accounted for by the larger acreage in alfalfa. Other crops were a small proportion of the total in each of the two years and the reduction was mostly attributable to smaller acreages of field beans, peas, potatoes and other roots in 1948.

Of the most important small grains, less oats were grown and more mixed grain. The acreage in oats dropped from an average of 10 to five acres and that in mixed grains increased from an average of 11 to 15 acres. The acreage in wheat, barley and rye decreased and that in buckwheat increased slightly. These latter grains accounted for an average of three acres in 1917 and two acres in 1948.

Yields of all crops, with the exception of hay, were higher in 1948 than in 1917. The reduction in the hay yield, however, was considerable and more than counterbalanced the increased grain and corn silage yields. During the period from 1917 to 1948 there was, however, no trend towards greater yields of grain and smaller yields of hay in the province.

Livestock Program.- The size of the livestock enterprise on the 111 farms was practically the same in each of the two years. However, the average number of horses per farm decreased from four to three and few colts were kept in 1948

as compared with 1917. The number of animal units 1/ of cattle increased from 21 to 22 with the increase taking place in heifers and calves. There was an average of 16 cows per farm in 1917 and 15 in 1948 while the number of heifers and calves increased from nine to twelve. In each of the two years it was typical for a herd bull to be kept on each of the farms. The cattle were kept for dairy purposes and there were practically no steers on the farm in either of the two years. While the number of cows was no greater in 1948 than in 1917, the amount of milk produced per cow 2/ was higher, increasing from 4,600 to 5,500 pounds. This higher milk production was due to changes in feeding and breeding practices which occurred during the period. Evidence of a higher rate of feeding shows up in the growing of more grain and hay for dairy cattle and in greatly increased purchases of feed. Feed purchases increased from \$360 in 1917 to \$1,157 in 1948. With the average milk production per farm increasing from 73,600 to 82,500 pounds, the cost of purchased feeds per 100 pounds of milk produced had more than doubled.

Among the livestock, swine and poultry were the next in importance on these farms; the number of hogs had decreased and the number of poultry increased over the 30-year period. An average of 12 hogs was sold per farm in 1917 and the number had dropped to eight in 1948, while the average number of hens kept increased from 70 to 95. Very few sheep and practically no fur animals were kept on these farms in either of the two years.

Table 2.- Livestock Program on 111 Farms in Dundas County, Ontario, 1917 and 1948

Class of livestock	: 1917	: 1948
	: Average	: Average
	:	:
	- number of animal units -	
Horses	4.6	3.1
Cattle	21.1	21.8
Sheep and lambs	.1	-
Swine	1.8	1.2
Poultry	.7	1.6
Fur animals	-	-
All livestock	28.3	27.7

1/ An animal unit represents an average mature horse or cow or the equivalent in other livestock based on feed consumption and manure production.

2/ This does not include the milk fed to livestock as it was not available on the 1917 records.

It is evident that dairying was the dominant enterprise on these farms in each of the two years. This can be observed from the data presented in Table 2 which show the average number of animal units of each type of livestock.

The numbers of farms reporting different classes of livestock in each of the two years are given in Table 3. Horses, although considerably lower in numbers in 1948, were still an important source of power on most farms in the county. Only two of the farms had completely dispensed with horses.

Table 3.- Numbers of Farms Reporting Different Classes of Livestock, Dundas County, Ontario, 1917 and 1948

Class of Livestock	Number Reporting	
	1917	1948
Number of farms	111	111
Horses	111	109
Cattle	111	111
Sheep and lambs	10	11
Swine	106	81
Poultry	111	92

There is evidence of some specialization in certain types of livestock production having taken place since 1917. In each of the two years all the farmers kept dairy cattle. About the same number kept sheep and lambs in 1948 as in 1917. Both the number of swine and the number of farmers keeping swine declined. However, while the number of poultry increased considerably, the number of farmers keeping poultry decreased considerably. Thus, on the average, the farmers that kept poultry kept them in larger numbers.

Capital Investment.- The average investment per farm was higher in 1948 than in 1917; in 1917 the 111 farms had an average investment of \$13,382 and in 1948, \$15,871. In the earlier year 68 per cent of the total investment was in real estate; this proportion had dropped to 54 per cent by 1948. The proportion in livestock had increased from 22 per cent to 28 per cent and the proportion in machinery and equipment increased from eight to 16 per cent. The inventory of feed and supplies was at a low point at the time of the year when the records were taken and in each of the two years this item amounted to two per cent of the total investment. The actual

values of the different categories of capital investment are provided in Table 4.

Table 4.- Average Inventory Values on 111 Farms in Dundas County, Ontario, 1917 and 1948

	1917	1948
	- dollars -	
Total real estate	9,147	8,589
Livestock	2,898	4,514
Machinery and equipment	1,091	2,534
Feed and supplies	246	234
Total investment	13,382	15,871

The value of real estate decreased from \$9,147 in 1917 to \$8,589 in 1948. The average value of land on these 111 farms was estimated at \$5,138 in 1917 and \$3,999 in 1948. However, the value of buildings was estimated at \$4,009 in the earlier year and \$4,590 in the later year. Thus, while the real estate investment decreased considerably, the value of buildings was actually higher than in 1917. The land in the area was fairly well developed by 1917 and in the period between 1917 and 1948 there was little land development. It is quite likely that there was considerable improvement in farm buildings.

The investment in livestock increased from \$2,898 to \$4,514. Practically all of this increase was accounted for by changes in values, for, as was noted in the section on livestock, the livestock population on these farms was about the same in the two years. Average values of livestock on hand in Ontario in each of the two years are available in the reports of the Statistics Branch of the Ontario Department of Agriculture. Except for horses, the values of all types of livestock were higher in 1948 than in 1917. The following are averages for all of Ontario. Milk cows were valued at an average of \$76 in 1917 and \$144 in 1948 and the increase in the value of other cattle was from \$40 to \$90. Swine were worth \$13 each in 1917 and \$35 in 1948. It can be seen that 1948 was a year of relatively high livestock prices compared with 1917. This, however, does not hold true for all prices of agricultural products because in 1948 the average Ontario prices of all crops except hay were considerably lower than in 1917.

The value of machinery and equipment increased from \$1,091 in 1917 to \$2,534 in 1948, an increase of 132 per cent. Many of these farms became highly mechanized during the 30-year period. In 1917 there were no tractors on these 111 farms, while in 1948, 65 of the farms, or well over one-half, had tractors. The introduction of tractors was accompanied by the use of certain other types of machinery usually associated with tractor farming, such as different types of ploughs, discs and cultivators. This change to extensive use of tractor power is associated with the reduction in the number of horses and a reduction in the amount of man labour on farms.

Receipts.- Total farm receipts increased from \$3,460 in 1917 to \$5,546 in 1948, an increase of 60 per cent. Total receipts include cash receipts and inventory increases. Cash receipts accounted for most of the increase in total farm receipts, increasing from \$2,737 in 1917 to \$4,721 in 1948, an increase of 72 per cent. The inventory increase was only slightly higher in 1948.

The largest item in cash receipts was the sale of livestock products. This rose from \$1,683 in 1917 to \$2,752 in 1948, an increase of 64 per cent. This item accounted for over one-half the cash receipts in each of the two years.

Livestock sales more than doubled between 1917 and 1948, increasing from \$802 in 1917 to \$1,713 in 1948. As noted previously 1948 was a year of high livestock prices compared with 1917.

Crop sales were not a main source of cash receipts in either of the two years and they dropped from \$194 in 1917 to \$171 in 1948. Dundas County is an area of highly intensified livestock production and, while crop sales were not very large, feed purchases were considerable. The lower grain prices in 1948 also contributed to the lower receipts from the sale of crops.

Miscellaneous farm receipts made up the remainder of total cash receipts and were a small proportion of the total in each of the two years. They increased from \$58 in 1917 to \$85 in 1948.

Milk was the main item in the sales of livestock products; this increased from \$1,541 in 1917 to \$2,215 in 1948. Other types of dairy products were relatively unimportant in each of the two years; a little butter was sold in 1917 and a little cream was sold in 1948. Next in importance among livestock

product sales was the sale of eggs; there was a considerable increase, from \$105 in 1917 to \$519 in the latter year. Other sales of livestock products were practically negligible in each of the two years.

Table 5.- Receipts for 111 Farms in Dundas County, Ontario, 1917 and 1948

	1917 Average	1948 Average	Change from 1917 to 1948
	- dollars -		- per cent -
Crop sales	194	171	- 12
Livestock sales	802	1,713	114
Livestock product sales	1,683	2,752	64
Miscellaneous farm receipts	58	85	47
Total cash receipts	2,737	4,721	72
Total inventory increase	723	825	14
Total farm receipts	3,460	5,546	60

The value of the livestock sales doubled between 1917 and 1948. This was mainly a result of increased livestock values in the latter year. There were considerable changes in the numbers of the various types of livestock that were sold. Fewer horses but more cows and heifers were sold in 1948. Fewer calves were sold, as they were kept and sold as heifers or cows. Fewer hogs were sold but the number of hens sold had increased greatly by 1948.

Expenses.- The expenses increased much more than the receipts. Total farm expenses increased from \$1,802 in 1917 to \$3,941 in 1948, an increase of 119 per cent. This compared with an increase of 60 per cent in receipts.

In both years, about three-quarters of the total expenses were made up of current expenses. Capital expenses and an inventory decrease made up the remainder. Current expenses increased from \$1,165 in 1917 to \$2,715 in 1948, an increase of 133 per cent. In 1917 the expense for labour was the largest item of current expenses; the labour item includes a charge for unpaid family labour and an allowance for the board of hired labour, in addition to the cash cost of hired labour, but does not include a charge for the operator's labour. The cost of labour was \$401 in 1917

and \$531 in 1948, an increase of 32 per cent. Purchased feeds were the next largest item in the earlier year and averaged \$360 on these farms at that time. By 1948, the expenditure for purchased feeds had increased to an average of \$1,157 per farm which was three times that of the earlier year and considerably greater than the expense for labour in 1948. The next largest item in 1917 was taxes, which averaged \$98 in that year and had increased to \$126 in 1948. This was an increase of 29 per cent, the smallest increase of any item of current expense. Machinery operating costs amounted to \$274 in 1948 as compared with \$45 in 1917; this was an increase of 509 per cent. Practically no fertilizer was purchased in 1917 and by 1948 the average expenditure per farm was \$16.

Table 6.- Expenses for 111 Farms in Dundas County,
Ontario 1917 and 1948

	1917	1948	Change from 1917 to 1948
	Average	Average	
	- dollars -		- per cent -
Purchased feeds	360	1,157	221
Labour	401	531	32
Taxes	98	126	29
Fertilizer	1	16	1,500
Machinery operating costs	45	274	509
Hired machine work	22	58	164
Other current expenses	238	553	132
Total current expenses	1,165	2,715	133
Total capital expenses	437	694	59
Total inventory decrease	200	532	166
Total farm expenses	1,802	3,941	119

Total capital expenses averaged \$437 in 1917 and \$694 in 1948, an increase of 59 per cent. Purchases of livestock were the largest single item and these were more than twice as large as in the earlier year, increasing from \$191 in 1917 to \$413 in 1948. New machinery and equipment purchases did not increase as rapidly; they averaged \$177 in the earlier year and \$217 in the later year. Purchases and improvements of buildings and land decreased from \$68 to \$64.

Farm Earnings.— It has been mentioned that total farm receipts increased 60 per cent while total farm expenses in-

creased 119 per cent over the 30-year period. As a result, farm income was slightly lower in 1948, dropping from \$1,658 to \$1,605, a decline of three per cent. Farm income is the difference between total receipts (exclusive of the value of products consumed on the farm) and total expenses. When a charge was made for interest on the money invested in the farm business, the labour income averaged \$1,016 in 1917 and had dropped to \$989 in 1948, also a decline of three per cent. However, these farmers were in a much more vulnerable position in the later year although their incomes were much the same; receipts were considerably higher but there were much greater expenses to be met in the operation of the farm business.

Figures on the value of farm products consumed on the farm and the value of the use of the house were not available for 1917. In 1948, these total perquisites amounted to \$501; this \$501 added to \$989 labour income, brought the total to \$1,490. These were the average labour earnings for the 111 Dundas County farms in 1948.

Table 7.- Earnings for 111 Farms in Dundas County
Ontario, 1917 and 1948.

	1917 Average	1948 Average	Change from 1917 to 1948
	- dollars -		- per cent -
Total farm receipts	3,460	5,546	60
Total farm expenses	1,802	3,941	119
Farm income	1,658	1,605	- 3
Interest on investment	642	616	- 4
Labour income	1,016	989	- 3
Total perquisites	-	501	-
Labour earnings	-	1,490	-

As indicated previously, labour income on the 111 farms averaged about the same in 1917 and 1948. However, there was a tendency towards larger individual losses and larger individual gains in 1948. In 1917, 95 of the farms had labour incomes between 0 and \$2,000 while only 66 of the farms were in this range in 1948. This is another effect of the increased receipts and expenses in the later year which resulted in farmers having the opportunity of making more money if expenses were kept to a minimum but also running the risk of losing more money if expenses were not kept

carefully under control.

Size of farm, whether measured by the acreage in crops or by the number of animal units, is usually considered to be closely associated with labour income. These relationships were clearly evident in the group of farms in 1917 but there was very little evidence of such relationships in 1948. The maintaining of expenses at as low a level as possible is probably now at least as important as size of business.

Labour.- During the 30-year period there was a reduction in the amount of grain produced for sale and an increase in the production of crops to be used for livestock feed. Also the emphasis had shifted towards feed for cattle as the number of horses had been reduced. This change in emphasis followed the introduction of the tractor and tractor-drawn machinery. The milking machine and other labour-saving devices had brought a considerable degree of mechanization to the dairy cattle enterprise.

These innovations resulted in a decrease in the amount of labour used on these farms from an average of 2.0 men per farm in 1917 to an average of 1.7 men in 1948. This decrease had not been as great as in areas where crop production is the main enterprise because the livestock enterprise had not lent itself to mechanization to the same extent as crop production. However, with the aid of the mechanization that had taken place on these farms, fewer men were taking care of the same crop acreage and the same amount of livestock and these livestock were producing at a higher rate.

More detailed information on the changes in the labour supply on these farms is available in a study also carried out in 1949 on population movements in Dundas County. 1/ The analysis in that study was made on basically the same group of farms and showed that the average number of persons per farm dropped from 5.3 in 1918 to 4.3 in 1949. The number of males 21 or more years of age remained about the same at 1.7 per farm. This indicates that the labour supply in 1948 was practically all supplied by adult males whereas in 1917 others on the farm, particularly the non-adults, contributed considerably to the labour supply.

1/ Population in Process, Dundas County, Ontario:1918-1949.
Department of Agricultural Economics, Ontario Agricultural College, Guelph, Ontario in co-operation with Economics Division, Marketing Service, Department of Agriculture, Ottawa, Canada.

The average number of persons under 21 years of age dropped from 2.3 in 1918 to 1.3 in 1949.

Another change revealed by the population study was the increase in the age of the operators. The average age of the operator was 46 years in 1918 and 53 years in 1949.

Details of the number of months of hired and family labour are not available for the 111 farms included in the farm business studies. However, hired labour accounted for an increased proportion of the labour cost in 1948.

Mechanization. - The most striking change in the mechanization of Canadian farms since 1920 has been the introduction of the tractor and associated equipment. None of these Dundas County farms had tractors in 1917; one-half of them had tractors in 1948. On the farms that had tractors in 1948, however, horses were still kept in all but two cases. The question arises as to the necessity of keeping horses on the farm after tractors are purchased and whether they perform sufficient work to justify keeping them. In a study carried out in 1950 ^{1/} forty-eight farms were visited in a similar area in Eastern Ontario, the area between Carp and Arnprior in Carleton County. In this area, tractors where available were used in most of the operations in preparation for seeding except for rolling and drag harrowing where horses were used to a considerable extent. Most of the seeding was done with horses as was most of the cultivating of row crops. In the harvesting operations, horses were used extensively for mowing and raking hay, hauling grain, hay and corn and, to a lesser extent, on the corn and grain binders. They were also used on most farms for hauling wood and manure, particularly in the winter months.

Most of the tractors in Eastern Ontario have been purchased since the 1930's leaving the horse machinery and horses still available, since farmers cannot afford to shift to a complete new line of equipment in a few years. Thus, it is not possible for the saving in labour to show up very rapidly, especially since the tractor has mechanized crop production and not livestock production to any great extent. Also, on many farms in Eastern Canada it may not be physically possible to farm without horses.

Another change, probably just as important to the dairy farmer as tractors are to the grain farmer, was occasioned by the

^{1/} Unpublished data, Economics Division, Marketing Service, Department of Agriculture, Ottawa, Canada.

introduction of milking machines. Of the 111 farms, 67 had purchased milking machines by 1948. These machines are especially important considering the smaller number of non-adults remaining on the farms since milking is one of the jobs where boys and girls provided a great deal of help some years ago.

The total investment in machinery and equipment averaged \$1,091 in 1917 and \$2,534 in 1948, an increase of 132 per cent. The proportion of the total investment represented by machinery and equipment increased from eight per cent to 16 per cent. This increased investment in machinery resulted in higher machinery operating costs; they increased from \$45 in 1917 to \$274 in 1948. The cost of hired machine work increased from \$22 to \$58. Thus, while increasing the productivity of labour, the increased mechanization of these farms was a large factor in increasing cash expenses and placing the farmers in a more vulnerable position with regard to the need for cash to operate their businesses.



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